Focus Report

New Chemicals Program

Case Number: P-15-0487

Report Status: Complete

Focus Date: 06/18/2015

Focus Chair: Jim Alwood

Contractor: Legacy Placeholder

Consolidated Set: P-15-0488,P-15-0489,P-15-0490,P-15-0491

I. Notice Information

Submitter: Daewoo International USA Corp

CAS Number: None

Chemical Name: Multi-walled carbon nanotubes

Use: Additive for electro-static discharge (ESD) in electronic devices, electronics, and materials ([redacted] additive for weight reduction in materials ([redacted] additive to improve mechanical properties or electrical conductivities ([redacted] a heat-generating element in heating devices and materials ([redacted] additive for heat transfer and thermal emissions in electronic devices and materials ([redacted] semi-conductor, conductive, or resistive element in electronic circuitry and devices ([redacted] additive to improve conductivity in electronic circuitry, energy storage systems, and devices ([redacted] electron emitter for lighting and x-ray sources ([redacted] additive for electromagnetic interface (EMI) shielding in electronic devices ([redacted] additive for electrodes in electronic materials and electronic devices ([redacted] catalyst support in chemical manufacturing ([redacted] coating additive to improve corrosion resistance or conductive properties ([redacted] additive for fibers in structural and electrical applications ([redacted] additive for fibers in fabrics and textiles ([redacted] filter additive to remove nanoscale materials ([redacted] semi-conducting compounding additive for high-voltage cable ([redacted] and additive for super-hydrophobicity ([redacted] Consoildated Set: P-15-487, P-15-488, P-15-489, P-15-490, adn P-15-491.

Other Uses: [redacted]

[redacted]

Bind: ☐ **imports:** ☑

Manufacture: ☐ **PV-max(kg/yr):** [redacted]

II. SAT Results

Health Rating 1: 2 **Health Rating 2:**

Occupational Rating: [redacted] **Non Occupational Rating:** 2

Ecotox Rating 2: **Environmental Rating:** 1

Health Rating Comment 1:

Health Rating Comment 2:

Persistence 1: 3 **Bioaccumulation 1:** 1 **Toxicity 1:** 2

PBT Comments 1:

III. OTHER FACTORS

Categories

Health Chemical Category: Respirable Poorly Soluble Particulates

Ecotox SARs: Neutral Organics

Ecotox SAR Class: Neutral Organics

Ecotox TSCA New Chemical Category: Nano, Neutral Organics

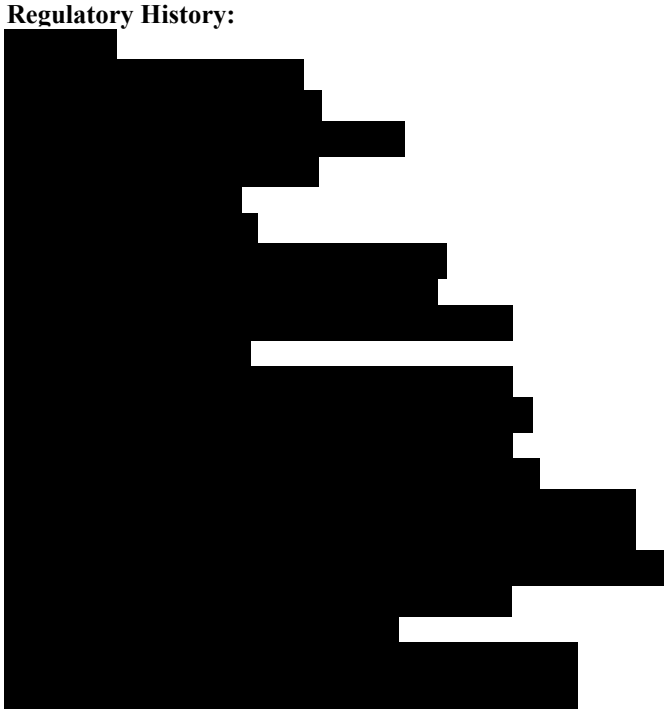
Related Cases / Regulatory History

Health Related Cases: [redacted]

Ecotox Related Cases: [redacted]

[redacted]

Regulatory History:



MSDS/Label Information

MSDS: Y **Label:** N

General Equipment: A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source. // Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield. /// Wear appropriate gloves. /// Wear appropriate clothes.

Respirator: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. (1) Dust, mist, fume-purifying respiratory protection: any air-purifying respirator with a corpuscle filter of high efficiency; any respiratory protection with a electromotion fan (for dust, mist, fume-purifying) high-efficiency particulate filter respirator attached self-service protector. (2) For unknown concentration or immediately dangerous to life or health: supplied-air respirator (hybrid air-line mask) or supplied-air respirator with full facepiece.

Health Effects: Causes serious eye irritation. May cause respiratory tract irritation.

TLV/PEL(PMN or raw material): - [redacted]

LVE PPE:

Exposure Based Information

Exposure Based Review (Chemistry): N

Exposure Based Review (Health): N

Exposure Based Review (Ecotox): N

Exposure Based Review (Occupational): Y

Exposure Based Review (Non-Occupational):

Exposure Based Review (Environmental):

IV. Summary of SAT Assessment

Fate

Fate Summary: P-15-0487-91
FATE:
Solid
S < 0.001 mg/L at 25 °C (E)
VP < 1.0E-6 torr at 25 °C (E)
BP > 400 °C (E)
H < 1.00E-8 (E)
POTW removal (%) = 0-90 via possible sorption
Time for complete ultimate aerobic biodeg > mo
Sorption to soils/sediments = low - v.strong
PBT Potential: P3B1
*CEB FATE: Migration to ground water = negl - rapid

Ecotox

Ecotox Values

Fish 96-h LC50: *(P)

Daphnid 48-h LC50: *(P)

Green Algae 96-h EC50: *(P)

Fish Chronic Value: *(P)

Daphnid Chronic Value: *(P)

Green Algae Chronic Value: *(P)

Ecotox Value Comments: Predictions are based on SARs for Neutral Organics; SAR chemical class = Neutral Organics; MW 100000; solid with unknown mp (P); S < 0.001 mg/L at 20C (P); pH7; effective concentrations based on 100% active ingredients and nominal concentrations; DW hardness < 150.0 mg/L as CaCO3; and DW TOC <2.0 mg/L;

Ecotox Factors

Acute Aquatic Factors:	**Most Sensitive Endpoint:**	**Assessment Factor:** 5/10	**CoC:**
Chronic Aquatic Factors:	**Most Sensitive Endpoint:**	**Assessment Factor:**	**CoC:**

Comments:

V. Summary of Exposure/Releases

Engineering Summary Release

Exposures/Releases	Release	Release
Scenario	Proc 2: Formulation of Coatings Additive (PV)	Proc 2: Formulation of Coatings Additive (
Site		
Media	Water or Incineration or Landfill	Water or Incineration or Landfill
Descriptor A	Conservative	Output 2
Quantity A (Release=kg/site/day; Exposure=mg/day)		
Frequency A (day/year)		
Descriptor B		
Quantity B (Release=kg/site/day; Exposure=mg/day)		
Frequency B (day/year)		
From	Equipment Cleaning Losses of Liquids from Multiple Vessels	Cleaning Solid/ Powder Residuals from Con Used to Transport the Raw Material
Workers		
ExposureType		

Exposures/Releases	Exposure	Exposure
Scenario	Proc 2: Formulation of Coatings Additive (PV)	Proc 2: Formulation of Coatings Additive (PV)
Site		
Media	Dermal	Inhalation
Descriptor A	High End	Worst Case
Quantity A (Release=kg/site/day; Exposure=mg/day)		
Frequency A (day/year)		
Descriptor B		Typical
Quantity B (Release=kg/site/day; Exposure=mg/day)		
Frequency B (day/year)		
From	Unloading Solid Raw Material from Transport Containers	Unloading Solid Raw Material fro Transport Containers
Workers		
ExposureType	Solid	Particulate

Exposures/Releases	Release	Release
Scenario	Use 1: Incorporation as Additive in Articles (PV)	Use 1: Incorporation as Ad Articles (PV)
Site		
Media	Water or Incineration or Landfill	Water or Incineration or La
Descriptor A	Output 2	Output 2

Exposures/Releases	Release	Release
Quantity A (Release=kg/site/day; Exposure=mg/day)	[redacted]	[redacted]
Frequency A (day/year)	[redacted]	[redacted]
Descriptor B		
Quantity B (Release=kg/site/day; Exposure=mg/day)		
Frequency B (day/year)		
From	Cleaning Solid/ Powder Residuals from Containers Used to Transport the Raw Material	Equipment Cleaning Losse Solids from Process Vessel
Workers		
ExposureType		

Exposures/Releases	Release	Exposure
Scenario	Use 1: Incorporation as Additive in Articles ([redacted] PV)	Use 1: Incorporation as Additive in Articles ([redacted] PV)
Site	[redacted]	[redacted]
Media	Water or Air or Incineration or Landfill	Dermal
Descriptor A	Conservative	High End
Quantity A (Release=kg/site/day; Exposure=mg/day)	[redacted]	[redacted]
Frequency A (day/year)	[redacted]	[redacted]
Descriptor B		
Quantity B (Release=kg/site/day; Exposure=mg/day)		
Frequency B (day/year)		
From	Unloading Solid Raw Material from Transport Containers	Unloading Solid Raw Material from Transport Containers
Workers		[redacted]
ExposureType		[redacted]

Exposures/Releases	Release	Release
Scenario	Use 2: Appication of Coatings ([redacted] PV)	Use 2: Appication of Coatings ([redacted] PV)
Site	[redacted]	[redacted]
Media	Air	Water or Incineration or Landfill
Descriptor A	Output 2	High End
Quantity A (Release=kg/site/day; Exposure=mg/day)	[redacted]	[redacted]
Frequency A (day/year)	[redacted]	[redacted]
Descriptor B		
Quantity B (Release=kg/site/day; Exposure=mg/day)		
Frequency B (day/year)		

Exposures/Releases	Release	Release
From	Coating Using Hand-Held Spray Gun	Cleaning Liquid Residuals from Containers U Transport the Raw Material
Workers		
ExposureType		

Exposures/Releases	Exposure	
Scenario	Use 2: Appication of Coatings (PV)	Use 2: Ap
Site		
Media	Inhalation	Dermal
Descriptor A	Upper Bound	High End
Quantity A (Release=kg/site/day; Exposure=mg/day)		
Frequency A (day/year)		
Descriptor B		
Quantity B (Release=kg/site/day; Exposure=mg/day)		
Frequency B (day/year)		
From	Coating Using Hand-Held Spray Gun	Unloading
Workers		
ExposureType	Mist	Liquid

Exposure Summary Release

Chemical ID: P-15-0487
Reviewer: NN-Nano Interest

Exposure Scenario	Water						Land fill(non-sludge)	
Release Activity(ies) exposure Calculations	Drinking Water		Fish Ingestion					
	ADR mg/kg/day	LADD mg/kg/day	ADR mg/kg/day	LADD mg/kg/day	7Q10cc ug/l	PDM Exceeded # Days	LADD mg/kg/day	ADI mg/kg/
PROC 2: Max ADR	2.11e-4 2.11e-4	0.00e+0	1.09e-2	0.00e+0	1.04e+1	0.00e+0	0.00e+0	6.04e-6
PROC 2: PDM1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	1.04e+1	NaN	0.00e+0	0.00e+0
PROC 2: PDM2	0.00e+0	0.00e+0	0.00e+0	0.00e+0	4.47e+0	NaN	0.00e+0	0.00e+0
PROC 2: Max LADD	0.00e+0	1.28e-6	0.00e+0	4.63e-5	0.00e+0	0.00e+0	2.78e-7	0.00e+0
USE 1: Max ADR: max acute eco	2.15e-4 2.15e-4	0.00e+0	1.11e-2	0.00e+0	1.06e+1	0.00e+0	0.00e+0	6.15e-6
USE 1: PDM1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	1.06e+1	NaN	0.00e+0	0.00e+0
USE 1: PDM2	0.00e+0	0.00e+0	0.00e+0	0.00e+0	7.21e+0	NaN	0.00e+0	0.00e+0
USE 1: Max LADD	0.00e+0	1.79e-6	0.00e+0	6.45e-5	0.00e+0	0.00e+0	3.86e-7	0.00e+0

Exposure Scenario	Water						Land fill(non-sludge)	
Release Activity(ies) exposure Calculations	Drinking Water		Fish Ingestion					
	ADR mg/kg/day	LADD mg/kg/day	ADR mg/kg/day	LADD mg/kg/day	7Q10cc ug/l	PDM Exceeded # Days	LADD mg/kg/day	ADF mg/kg/
USE 2: Max ADR	1.81e-4 1.81e-4	0.00e+0	9.38e-3	0.00e+0	8.94e+0	0.00e+0	0.00e+0	5.18e-6
USE 2: PDM1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	8.94e+0	NaN	0.00e+0	0.00e+0
USE 2: Max LADD	0.00e+0	2.03e-6	0.00e+0	7.30e-5	0.00e+0	0.00e+0	1.03e-5	0.00e+0

1.Exposure scenario titles consist of release activity followed by exposure calculation abbreviation.
2.Release activities are from engineering report's Manufacturing (Mfg), Processing (Proc) and Use release ac combined in one exposure scenario if their releases occur at same location.
3.Exposure calculations are Acute Dose Rate (ADR), Lifetime Average Daily Dose (LADD), and Probabilistic one, two, or all three exposure calculations per exposure scenario. CC is the aquatic concentration of concern
4.This column displays concentration values for the 7Q10 streamflow, which is defined as the average daily st lowest flow within a ten year period.

Result Table : Exposure Based(XB)/Persistent (P2B2) Criteria

Parameter	Exp Based	Persisten
Drinking(Surface) Water Dose (mg/kg/day)	No	No
Fish Ingestion Dose (mg/kg/day)	No	No
Inhalation Dose (mg/kg/day)	No	No
Groundwater Dose (mg/kg/day)	No	No
Surface Water Release After Treatment (kg/yr)	No	No
Total Release After Treatment (kg/yr)	No	No
Consumer Use?	No	

VI. Focus Decision and Rationale

Regulatory Actions

Focus Decision: PMN Standard Review **Focus Decision Date:** 06/22/2015

Decision Type:

Rationale: P-15-0487, P-15-0488, P-15-0489, P-15-0490, P-15-0491 will be placed into a standard review for human health and ecotoxicity concerns. A full team will be needed for the review process. Human health hazard concerns were moderate for dermal and inhalation exposures. Potential risks to workers and the environment will be determined during the review process. The SAT reviewers found this chemical to fit the human health category of respirable poorly soluble particulates. Ecotoxicity concerns were low based on SAR predictions for neutral organics. This PMN has a rating of P3B3T2. Potential risks to the environment were low based on no effects at saturation. During the review process the team should evaluate the submitted data.

COC: No effects at saturation

Summary of Exposures and Releases

Use 1
[redacted] sites, [redacted] days/yr, [redacted] workers
Inhalation (Particulate): Typical: [redacted] mg/day; Worst Case: [redacted] mg/day
Dermal: [redacted] mg/day [redacted]

Releases to Water: [redacted] kg/site-day over [redacted] days/yr
Or Air or Incineration or Landfill
Releases to Water: [redacted] kg/site-day over [redacted] days/yr
Or Incineration or Landfill
Releases to Water: [redacted] kg/site-day over [redacted] days/yr
Or Incineration or Landfill
Releases to Water: [redacted] kg/site-day over [redacted] days/yr
Or Incineration or Landfill

Fate Releases to Water (0% Removal)
SWC: 10.62 ppb
DW: LADD: 1.79E-06 mg/kg/day, ADR: 2.15E-04 mg/kg/day
FI: LADD: 6.45 E-05 mg/kg/day, ADR: 1.11E-02 mg/kg/day
>COC ([redacted] days/yr

PDM2
Fate Releases to Water (0% Removal)
SWC: 7.21 ppb
DW: LADD: 1.64E-06 mg/kg/day, ADR: 1.46E-04 mg/kg/day
FI: LADD: 5.90E-05 mg/kg/day, ADR: 7.57E-03 mg/kg/day
>COC [redacted] days/yr

Fate Releases to Landfill: LADD: 3.86E-07 mg/kg/day

Fate Releases to Air
Stack Air: LADD: 2.65E-07 mg/kg/day, ADR: 6.15E-06 mg/kg/day
Fugitive Air: LADD: 4.59E-07 mg/kg/day, ADR: 1.98E-05 mg/kg/day

Proc 2
[redacted] sites, [redacted] days/yr, [redacted] workers
Inhalation (Particulate): Typical: [redacted] mg/day; Worst Case: [redacted] mg/day
Dermal: [redacted] mg/day [redacted]
Dermal: [redacted] mg/day [redacted]

Releases to Water: [redacted] kg/site-day over [redacted] days/yr
Or Air or Incineration or Landfill
Releases to Water: [redacted] kg/site-day over [redacted] days/yr
Or Incineration or Landfill
Releases to Water: [redacted] kg/site-day over [redacted] days/yr
Or Incineration or Landfill

Fate Releases to Water (0% Removal)
SWC: 10.43 ppb
DW: LADD: 1.28E-06 mg/kg/day, ADR: 2.11E-04 mg/kg/day
FI: LADD: 4.63E-05 mg/kg/day, ADR: 1.09E-02 mg/kg/day
>COC ([redacted] days/yr

PDM2
Fate Releases to Water (0% Removal)
SWC: 4.47 ppb

DW: LADD: 1.01E-06 mg/kg/day, ADR: 9.04E-05 mg/kg/day
FI: LADD: 3.65E-05 mg/kg/day, ADR: 4.69E-03 mg/kg/day
>COC [redacted] days/yr

Fate Releases to Landfill: LADD: 2.78E-07 mg/kg/day

Fate Releases to Air
Stack Air: LADD: 1.90E-07 mg/kg/day, ADR: 6.04E-06 mg/kg/day
Fugitive Air: LADD: 4.06E-07 mg/kg/day, ADR: 1.75E-05 mg/kg/day

Use 2
[redacted] sites, [redacted] days/yr, [redacted] workers
Inhalation: [redacted] mg/day
Dermal: [redacted] mg/day [redacted]

Releases to Water: [redacted] kg/site-day over [redacted] days/yr
Or Incineration or Landfill
Releases to Air: [redacted] kg/site-day over [redacted] days/yr
Releases via Landfill: [redacted] kg/site-day over [redacted] days/yr

Fate Releases to Water (0% Removal)
SWC: 8.94 ppb
DW: LADD: 2.03E-06 mg/kg/day, ADR: 1.81E-04 mg/kg/day
FI: LADD: 7.30E-05 mg/kg/day, ADR: 9.38E-03 mg/kg/day
>COC ([redacted] days/yr

Fate Releases to Landfill: LADD: 1.03E-05 mg/kg/day

Fate Releases to Air
Stack Air: LADD: 3.00E-07 mg/kg/day, ADR: 5.18E-06 mg/kg/day
Fugitive Air: LADD: 6.37E-06 mg/kg/day, 2.75E-04 mg/kg/day

P2 Rec Comments:

Testing

Health:

Ecotox:

Fate:

Final Recommendations